Can Science Fiction Help Arctic Research?

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Introduction

Rapid changes are on-going in the Arctic, and their impact on Arctic societies requires supporting research tools that can keep up with the changes and even anticipate them. Two forces are strongly influencing the ways of life of Arctic inhabitants: climate change and development of information and communication technologies (ICTs). A literature genre that explores both is science fiction (SF). This study proposes the idea of analysing Arctic-related SF as a supporting tool in Arctic research. A specific matter present is SF for analysis is resilience, and an initial source, which will be used in this text as an example, is the SF book *Eyland* by the Icelandic author Sigríður Hagalín Björnsdóttir.

Science Fiction

SF is a genre of literature that focuses on the potential reactions of humankind to the development of technology, a new technological invention, or a natural or societal event. It describes potential future worlds or alternative realities in which humans encounter a major change and react to it[1]. The genre makes it possible for authors to test reactions to potential events in a 'laboratory of the mind'[2]. Additionally, the SF genre has a specific feature, which is a likelihood of moving from speculative to non-speculative fiction over time. A technology or an event described in an SF piece can be considered fictional within a frame of knowledge or a reality that is contemporary to its author. Knowledge and technology, however, develop with time. An invention that was at one point only a product of the imagination may become a reality[3].

Some SF authors find the changes in the Arctic important and interesting enough to site their stories in the region and to imagine potential reactions of its inhabitants to the changes. These stories, although fictional, are still grounded in contemporary reality and the state of science, and they are usually an attempt to predict to some degree what could happen if certain conditions were met.

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[1] Christopher McKitterick, 'Defining "Science Fiction". What Is Science Fiction…and Why Study It?', Gunn Center for the Study of Science Fiction, University of Kansas, 2016, http://www.sfcenter.ku.edu/SF-Defined.htm, accessed October 24, 2019.

[2] Susan Schneider, 'Thought Experiment: Science Fiction as a Window into Philosophical Puzzles' in Susan Schneider (ed.), *Science Fiction and Philosophy: From Time Travel to Superintelligence* (Hoboken: Wiley, 2016), 2.

[3] Annie Neugebaure, 'What Is Speculative Fiction', 2014, https://annieneugebauer.com/2014/03/24/what-is-speculative-fiction/, accessed October 23, 2019.

Experience shows that many speculative stories come to realisation[4]. Thus, SF pieces can be used as supporting material in the analysis of the Arctic changes in a meaningful way because the fictional situation presented in a piece has a chance of becoming factual. Assessing if worlds created in SF stories stayed resilient or underwent a transformation, and why, can be one element of analysis that can impart a lesson for the future.

Resilience

Resilience is an important part of many SF stories. It is the ability of a social-ecological system to return to its original state after it experiences a change caused by the pressure of outside or inside factors[5]. It can be also described as the 'potential for recovery from damage'[6] of a given system. One major factor threatening the resilience of Arctic systems is the climate change that is inducing global warming. As the fragile climate of the Arctic changes, societies inhabiting the region have to adjust and adapt. Another factor that could be considered a threat to the resilience of a system is the development of ICTs. The contemporary Arctic is becoming increasingly digitalised and its inhabitants are becoming more dependent on ICTs[7]. A serious malfunction of ICTs could also cause a necessity to adjust and adapt. Such adaptations and adjustments can lead to two possible outcomes. Firstly, the core elements of an Arctic system remain unchanged and recognisable despite adjustments and modifications introduced as a response to outside factors. Secondly, an Arctic system could change to a point at which core elements are unrecognisable. Such a situation is described as a transformation of a system, i.e. a situation, in which a system

[4] Rachel Seigel, '40 Fantastic Facts about Science Fiction that Became Reality', *Factinate*, https://www.factinate.com/things/40-fantastic-facts-science-fiction-became-reality/, accessed October 23, 2019; BBC, 'Science Fact: Sci-fi Inventions that Became Reality', 2016, https://www.bbc.com/news/health-38026393, accessed October 23, 2019.

[5] Marcus Carson, Garry Peterson, and Claudia Strambo, *Arctic Resilience Report 2016* (Stockholm: the Stockholm Environment Institute and the Stockholm Resilience Centre, 2016), http://www.deslibris.ca/ID/10090074.

[6] Jared M. Diamond, *Collapse: How Societies Choose to Fail or Succeed* (New York: Penguin Books, 2011).

[7] Mirva Salminen and Kamrul Hossain, 'Digitalisation and Human Security Dimensions in Cybersecurity: An Appraisal for the European High North', *Polar Record* 54, no. 2 (March 2018): 108–18, https://doi.org/10.1017/S0032247418000268; Michael Delaunay, 'Submarine Cables: Bringing Broadband Internet to the Arctic, a Life Changer for Northerners?', Arctic Portal, 2017, https://arcticyearbook.com/arctic-yearbook/2017/2017-briefing-notes/250-submarine-cables-bringing-broadband-internet-to-the-arctic-a-life-changer-for-northerners, accessed October 24, 2019; Loren Grush, 'Internet-from-space Provider OneWeb Says It Will Provide Coverage to the Arctic by 2020', *The Verge*, 2019, https://www.theverge.com/2019/9/4/20849142/oneweb-arctic-internet-coverage-space-2020, accessed October 24, 2019.

crosses a threshold, after which original elements of the system cannot be sustained[8].

Resilience and Transformation in Arctic Science Fiction

One example of Arctic-related SF that can serve as a source for analysis of the resilience and transformation of Arctic systems is the book *Eyland*[9] by Sigríður Hagalín Björnsdóttir. Set in Iceland, the story begins when Icelanders realise that their country is completely disconnected from the outside world. Any attempts of communication via the internet, phones, satellite systems or other means are failing. Communication with ICTs works only within the country. Contact with planes and ships that left Iceland is also lost, and no vehicles are arriving. Björnsdóttir creates a state of isolation of Iceland to conduct a mental exercise that tests the potential reaction of Icelandic society to such a situation. She describes the technical aspects, for instance marine cables connecting Iceland to the global network. Another matter the book explores is Iceland's sustainability in complete isolation. The author makes an effort to calculate how many people can survive on the island without facing starvation. Probably the most difficult to predict are reactions of society to the situation described in the book. Björnsdóttir describes one possible outcome, which is that democracy will fade away.

The marine cables' connections are described accurately. The three currently working submarine cables, FARNICE-1, DANICE, and Greenland Connect, are identified. In addition, CANTAT-3, currently not in commercial use, is included[10]. The author also describes an older marine cable, but precisely what that cable would be is not explained. The only information a reader receives is that the cable was built by the American Secret Service during the Cold War. The accuracy of such technical details in an SF book can be easily tested by examining scientific literature and referring to publicly accessible data. In the case of commercially used marine cables, data are widely available[11]. Finding information on the old cable connection established during the Cold War would require additional consultations with specialists because

[8] Carson, Peterson, and Strambo, *Arctic Resilience Report 2016*.
[9] Sigríður Hagalín Björnsdóttir, *Eyland* (Reykjavík: Benedikt bókaútgáfa, 2016).
[10] TeleGeography, *Submarine Cable Map: Iceland*, Last updated, October 4, 2019, https://www.submarinecablemap.com/#/country/iceland, accessed. October 24, 2019; *Landsvirkun, Data Connectivity in Iceland: A White Paper, 2016,* https://www.landsvirkjun.com/Media/international-data-connectivity-in-iceland-a-white-paper.pdf, *accessed October 24, 2019.*
[11] Ibid.

that kind of data is more difficult to acquire and confirm.

The number of people who could be sustained in Iceland in isolation, Björnsdóttir implied, is around 200,000. This is assessed by taking into account access to contemporary knowledge, and the current stage of development of resources that allow the use of geothermal energy. In the book there is also an example of historical assessments of the maximum population capacity of the island. It was assessed that in Iceland in the past, around 50,000 inhabitants could sustain themselves through the traditional use of land and agriculture and without access to modern technologies and knowledge[12]. Such estimations in a speculative narrative can be tested against similar estimations by scientists. However, the analyses are starting to get more complex because the estimations given cannot be proven. Many variables have to be considered to estimate the number correctly. In addition, factors that cannot be predicted or controlled could have a significant influence on the number of inhabitants who could be sustained by the resources available on an isolated island. In the case of Iceland, unpredictable events could be volcanic eruptions or periodically unfavourable weather that would affect crops. To make the estimation as accurate as possible, again, consultation with specialists would be required.

Why is the number of people that may survive given so much emphasis on the analysis of the resilience of the system under certain circumstances? It may be that a high number of people will need to die in order to keep the system self-sustainable, for example. See e.g. Dillon and Reid.

The knowledge of submarine cables and the assessment of the maximum number of inhabitants Iceland could entirely self-sustain are technical matters that are helpful in building a credible world in SF. However, '[s]cience fiction works that focus on social aspects of potential futures or alternate realities are as valuable as the ones that are more of user manuals of future technological devices'[13]. *Eyland* focuses on these social aspects of the created world.

Like many SF pieces, *Eyland* belongs to the class of dystopian works, that is, works describing a potential future that is unwanted or disturbing. Authors create dystopia when they want to bring attention to or raise awareness of the weaknesses of contemporary society that could become threatening under certain circumstances[14]. Björnsdóttir illustrates the interconnectedness and

[12] Sigríður Hagalín Björnsdóttir, *Eyland* (Reykjavík: Benedikt bókaútgáfa, 2016).
[13] Marcin Dymet, 'Letters from the Future', *Digital Culture & Society* 4, no. 2 (1 December 2018): 203–18, https://doi.org/10.14361/dcs-2018-0211.
[14] Literary Devices, *Dystopia*, https://literarydevices.net/dystopia/, accessed October 24, 2019.

dependencies of the contemporary world. In her book, the political system of Iceland transforms with surprising ease into a totalitarian system full of oppression and violence. The economic system also does not show any resilience to the new reality. Money loses its value, and a barter system, in which people start to exchange goods directly, comes into place. In addition, nationalistic trends grow exponentially, and any citizen or visitor with roots that are not purely Icelandic cannot feel safe anymore. Björnsdóttir explores what can cause a system to lose its resilience and what kind of pressure factors can contribute to a transformation of a system's elements.

The credibility of a potential reaction of Icelandic society to the situation Björnsdóttir created is much more difficult to verify because many factors could potentially affect the directions of action chosen by the Icelandic government, the media, and the citizens. The vision Björnsdóttir offered is only one option out of many. This opens up a great possibility for discussion and can help us reflect on human nature, current social problems in Iceland, and the potential effects of ideologies. If an SF book can induce such a discussion and self-reflection, it deserves attention.

Conclusions

As a genre that describes the reactions of humans to change, SF can be used as supporting material in Arctic research in social sciences. Climate change and the development of ICTs are affecting the Arctic's environment and inhabitants in visible ways. SF can serve as a mental experiment, helping us understand the potential reactions of Arctic systems to on-going and future changes. A feature of SF—a possibility of moving from speculative fiction to non-speculative fiction over time—makes the genre even more valuable because it proves that creations of the imaginations of SF authors lie close to reality.

Elements appearing in SF that could be analysed are the resilience and transformation exhibited in reaction to potential changes. In Sigríður Hagalín Björnsdóttir's *Eyland*, Iceland undergoes transformation in reaction to the isolation of the island from the rest of the world. The book includes technical elements that can be compared with the current state of knowledge, which gives the narrative credibility. It also includes speculative elements such as one possible reaction of society to potential changes. The speculative elements are particularly important while analysing the content of an SF book because they can help us visualise and understand better the possible outcomes of fictional, as well as currently on-going, changes. Such visualisations of what can happen

(or what could happen if) may play a role in increasing awareness of, for instance, threats related to climate change. It can also help us navigate and manage changes and threats. Studies of the fates of potential future societies may help us understand what can happen to our society under circumstances that are likely to happen, but that thus far are not certain.